The New Brunswick Museum
Le Musée du Nouveau-Brunswick

A Survey of Natural History Collections In New Brunswick

Donald F. McAlpine

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NEW BRUNSWICK MUSEUM

LE MUSÉE DU NOUVEAU-BRUNSWICK

A SURVEY OF NATURAL HISTORY COLLECTIONS IN NEW BRUNSWICK

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1986

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Everybody, I suppose likes to dream in his contemplative moments. . . . . My own dreams. . . . . are very definite. But there is one matter on which I love to dwell more than upon any other, and that is the great survey. . . . whose [role] is to make thoroughly known the geology, meteorology, botany and zoology of the province. It would cost a great deal of money, but this is no matter when you are dreaming. Besides it would be worth it.

W.F. Ganong (1904)

The Great New Brunswick Survey

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ABSTRACT

A survey of natural history collections in New Brunswick was carried out in 1984-85. It revealed 11 institutions and nine individuals maintaining what are considered 43 discreet collections of an estimated 401,576 natural history specimens. The collections ranged in number of specimens or lots from 50 - 106,000 with a mean collection size of 9,339 specimens or lots. Most of the material is of New Brunswick origin but 26% of the collections had holdings from outside North America. Those categories of collections best represented in the province were botany, entomology and geology. In nearly 75% of the collections specimens have been added only sporadically or at a rate of 1% or less over the last two years. Few of the collections have designated curatorial positions associated with them and their long-term maintenance is therefore uncertain. This survey suggests certain taxa are markedly under-represented in provincial collections. Most notably, non-vascular plants, freshwater invertebrates, and terrestrial invertebrates exclusive of insects. Natural history collections will have to be better funded and more adequately staffed if the full potential of provincial scientific collections is to be realized in the future.

RÉSUMÉ

Une étude des collections d'histoire naturelle du Nouveau-Brunswick fut effectuée en 1984-85. Cette étude révéla qu'il y avait onze institutions et neuf individus qui maintenaient ce qui est considéré comme 43 collections discrètes comprenant un nombre de spécimens d'histoire naturelle estimé à 401,576. Le nombre de spécimens ou de lots par collection varie de 50 à 106,000 avec une collection moyenne de 9,339 spécimens ou lots. La plupart des éléments qu'on y trouve proviennent du Nouveau-Brunswick mais 26% des collections viennent de l'extérieur de l'Amérique du Nord. Les catégories qui étaient le mieux représentées dans les collections de la province étaient celles couvrant la botanique, l'entomologie et la géologie. Pendant les deux dernières années, des spécimens n'ont été ajoutés que sporadiquement ou à raison de 1% ou moins dans près de 75% des collections. Très peu de ces collections sont entretenues par des conservateurs attitrés; à long terme, leur avenir reste donc incertain. Cette étude semble indiquer que certains taxums sont nettement sous-représentés dans nos collections provinciales, plus particulièrement les plantes non-vasculaires, les invertébrés d'eau douce et les invertébrés terrestres, insectes non compris. Les collections d'histoire naturelle devront donc être mieux financées et être pourvues d'un personnel plus adéquat si, à l'avenir, on veut atteindre le plein potentiel des collections scientifiques de la province.

ACKNOWLEDGEMENTS

I am grateful to the many individuals who provided information on those natural history collections in their care. The editorial comments of Lynne McAlpine and Randy Miller on an early version of the manuscript were much appreciated. It was only through the word-processing skills of Sherry M^{c}Cormick and Norma Thompson that Table 1 was entered on the New Brunswick Museum computer. A special thanks to Randy Miller, who actually volunteered to do the text and appendicies on his Apple.

Introduction

Although Jewett (1981) provided a summary of natural history collections in Canadian Institutions, much of her information relating to those collections in New Brunswick was in error or is now out of date. While there have been numerous surveys of various taxa of the major North American collections, (Biological Survey Project 1978, Bovin 1980, Choate and Genoways 1975, Coulette *et al.* 1976, Edwards *et al.* 1985, Zusi *et al.* 1982) the extent of these scientific resources at the level of any particular Canadian Province has not been closely examined, with one exception. The single exception is a recent inventory of natural history specimens of Prince Edward Island, carried out with the hope of establishing a Provincial natural sciences collection on the Island for the first time (Martin 1983). Undoubtedly many smaller collections containing important materials are overlooked in large scale surveys. This makes it difficult to assess the status of the collections resource on a regional level and provide sound recommendations on the steps that must be taken to manage and preserve this important part of our natural heritage. As Danks (1983) has noted, regional collections and collection centres serve to stimulate and support scientific research and education in a region.

In 1982 the New Brunswick Museum (NBM) initiated a programme to upgrade the storage facilities for its natural history collections and prepare associated data for computer entry. Funded in part by the National Museums of Canada with grant monies provided under the Museums Assistance Programme, this project has resulted in a major re-organization of the NBM collections and increased the accessibility of material to researchers.

With this collection re-organization as the impetus, a survey of natural history collections in New Brunswick was undertaken in 1984-85. It was intended that this survey would give an

assessment of the size and scope of the NBM collections in relation to other natural history collections in the province, as well as provide information critical to planning the future emphasis and growth for the NBM collections.

The information contained in this survey should however, also prove useful to any researcher concerned with locating collections of specific taxa housed in New Brunswick or in selecting a suitable institution in the province for the deposition of significant collections.

Survey Methods

The goal of this survey was to identify all significant natural history collections in New Brunswick. Significant natural history collections were deemed as those collections composed of 1,000 or more specimens or lots; or smaller collections considered of scientific value because they contained important distributional records, type material, or specimens of historical importance.

Although this survey was concerned with collections that have been assembled for research purposes, frequently collections serve both teaching and research functions. This is in spite of the fact that these functions do not complement each other. Generally collections of natural history specimens are accumulated for one of two primary purposes: for research (study and reference) or for education (display and instruction). Education or teaching collections are usually small relative to research collections, there is only minor duplication of species (i.e. data sets are minimal) and specimens are not considered permanent aquisitions but are replaced as they deteriorate through handling. Small collections assembled strictly for teaching purposes have been excluded from this survey, unless they fulfilled one or more of the criteria for the

inclusion of collections under 1,000 specimens or lots as noted above.

A copy of the form used in this survey is included as Appendix 1. Survey forms were mailed out in January, 1984 to all institutions in New Brunswick that were known or suspected to house natural history collections and to those individuals known or suspected to maintain significant private collections. A copy of the mailing list was included with each survey form and information on unlisted public or private collections was requested. I visited all of the larger collections reported here as well as visiting or telephoning the few for which survey forms were not returned or information provided was incomplete.

I have made every effort to include all significant natural history collections in New Brunswick in this survey. I am aware however that collections may have been overlooked. I suspect overlooked collections, if they exist, are probably private and most likely entomological or geological. I would be grateful to be made aware of any significant collections not included in this survey.

Results

This survey revealed 11 institutions or agencies and nine individuals in New Brunswick maintaining what are considered 43 discreet collections of an estimated 401,576 natural history specimens. Discreet collections were identified as those collections organized under a unique cataloguing system or collections, which though uncatalogued, are maintained separately from other collections. The collections reported here range in number of specimens or lots from 50-106,000 with a mean collection size of 9,339 specimens or lots. Although a number of these collections were originally assembled for teaching purposes and this continues to be their

major function, most of the collections contain specimens that have been the subject of published research. Data on all collections is summarized in Table 1 and Figures 1 and 2.

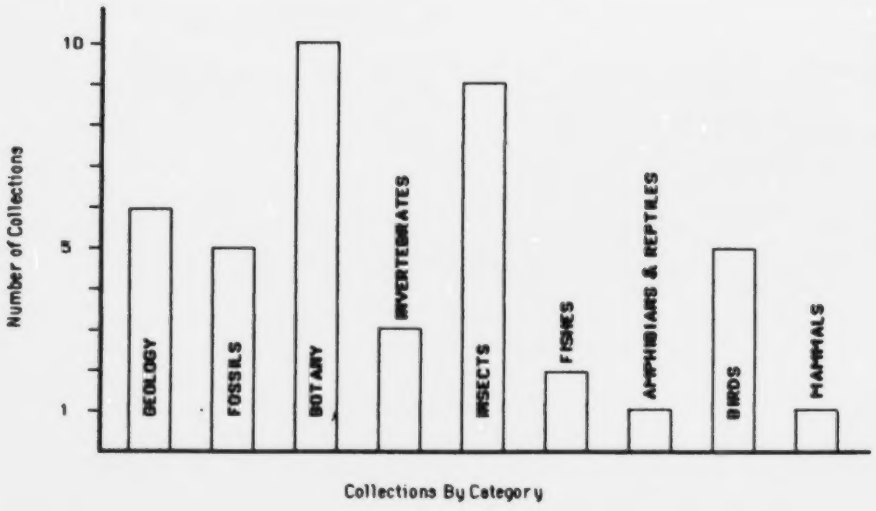

Figure 1. Number of Natural History Collections in New Brunswick as revealed by 1984 -85 survey.

Where standard acronyms are in use these have been followed in Table 1. Many of the collections are too poorly known to have been assigned acronyms and in these cases those acronyms shown were chosen by me. Boivin (1980) used the acronym FFP to designate the fungi collection housed at the Maritimes Forest Research Centre. However, since FPF (Forest Pathology Fredericton) has been in use by the Centre since the collections establishment (L.P. Magesi pers. comm.), I have chosen to use this latter designation.

Not surprisingly most of the material in those collections surveyed is of New Brunswick origin. Nevertheless 81% (35) of the collections reported some material from outside the province in their holdings, usually from adjacent provinces and states. As well 26% (11) of the collections reported holdings from outside North America, with six of these collections being housed at the New Brunswick Museum.

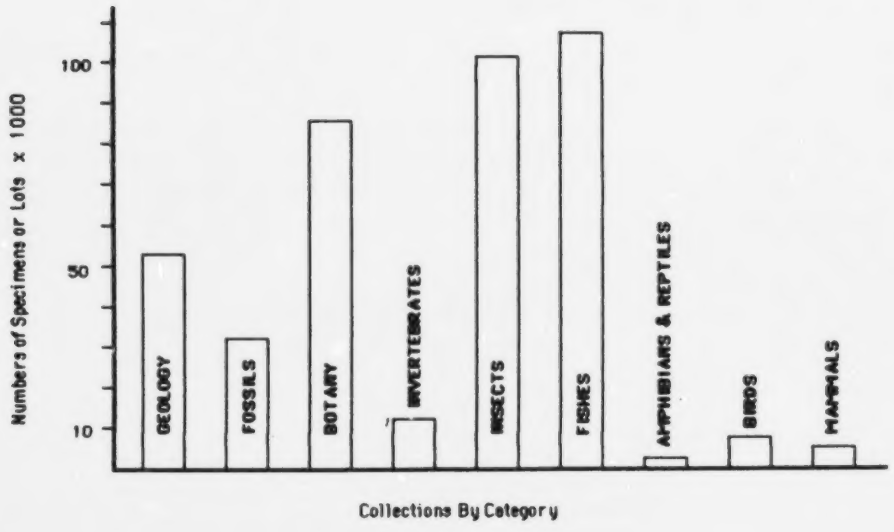

Figure 2. Number of specimens or lots in New Brunswick Natural History Collections as revealed by 1984-85 survey.

Those categories of collections best represented in the province by number were botany with ten, insects with ten and geology with six. Although I split geological (rocks and minerals) from fossil collections for the initial analysis, these two categories may be sensibly combined. When considered together these two categories comprise 11 collections (26% of total) and 84,050 specimens (21% of total). Six of the ten botanical collections are devoted to vascular plants

comprising 68,316 specimens (80% of total botanical specimens). Only single collections are devoted to fungi and lichens and bryophytes respectively. In the case of lichens and bryophytes the single collection is maintained privately.

Invertebrate specimens exclusive of insects are not well represented in collections in New Brunswick, with only three collections totalling 10,724 specimens. Most of this material is marine (86%) and most of it was collected in the Bay of Fundy-Scotian shelf region.

Collections of insects appear to be one of the better represented categories with ten collections, six (60%) of which are maintained privately. These private collections have 35% of the total insect specimens in the province. Lepidoptera predominate in six of the ten collections and undoubtedly some insect orders and species of non-commercial interest are poorly represented. The A.W. Thomas collection of Tabenids and the N. Rae Brown collection of Siphonaptera, Mallophaga, and Anoplura are notable exceptions. Vertebrate collections are concentrated at the New Brunswick Museum (five of nine collections) however the largest fish collection is housed at the Atlantic Reference Centre, Huntsman Marine Laboratory. Although fishes appear to be one of the best represented collections by number of lots (107,089, Figure 2) the vast majority of this material is composed of marine icthyoplankton.

The survey form was also designed to identify those agencies involved in research that might regularly generate collections of New Brunswick natural history materials but which did not maintain collections. The results showed that collecting activities were irregular and only rarely were series, or even vouchers, from field programmes deposited in any collection.

Table 1. Summary of information on natural history collections in New Brunswick. Single Asterisk (*) following acronym indicates a private collection.

Collection	Year Est.	Major Taxa	Geographical Coverage	No. specimens /lots**	Est. Yearly Growth	Previously Cited Collections	Type Material	Ancillary material	Remarks
Geology									
Agriculture Canada ACF	c.1950	soil profiles	Central & NW NB	50	0	0	NO	NO	accessible but uncurated.
Mount Allison University MAU	c.1955	economic geology	NB, NS, Gaspe,Canada, USA	2,500	sporadic	0	NO	polished sections thin sections	teaching collection.
Mount Allison University MAU	c.1955	mineralogy	NB, NS, Gaspe,Canada, USA	2,500	sporadic	0	NO	polished sections thin sections	teaching collection.
Mount Allison University MAU	c.1955	petrology	NB, Gaspe, Canada, USA	6,000	sporadic	0	NO	?	teaching collection strong in igneous petrology.
New Brunswick Museum NBM	c.1857	rocks & minerals	NB, NS, North America	7,000	0	Cummings, Gesner, Matthew, McIntosh	NO	NO	accessible but being re-organized.
University of New Brunswick UNB	prior to 1914	rocks & minerals	scattered areas in USA E. Canada	20-50,000	decreasing	0	NO	NO	yearly specimen loss due to student use.
Paleontology									
L. Ferguson Collection LFC*	1961	inverte-brates	N.Ellesmere Is, NWT	2,000	0	0	NO	NO	

Collection	Year Est.	Major Taxa	Geographical Coverage	No. Specimens /lots**	Est. Yearly Growth	Previously Cited Collections	Type Material	Ancillary Material	Remarks
Paleontology cont'd									
Mount Allison University MAU	c.1955	vascular plants & invertebrates	NB, NS, Gaspe, Canada USA	3,000	sporadic	0	NO	polished sections thin sections	teaching collection mainly Joggins N.S.
New Brunswick Museum NBM	c.1857	vascular plants & invertebrates	Southern NB, NFLD, BC, Europe	18,000	0	Matthew	NBM 200+ plants, insects etc.	0	accessible but being re-organized.
Radforth Fossil Collection RFC	1940 (?)	plants	Ellesmere Is, NWT	1,000	0	0	?	0	housed in the UNB Biology Dept. Fredericton.
University of New Brunswick UNB	prior to 1914	all major invertebrate phyla, carboniferous plants	scattered areas in USA, Canada	5000-10,000	0	0	10-12 conodont's	0	see remarks under UNB geology.
Botany									
A.R. Taylor Collection ARTs	19?	marine algae & seagrasses	NB (Bay of Fundy) PEI, Gulf of St. Lawrence, UK Australia	5,000	4%	P.R. Neuroth	slides of fragments of holotypes & lectotypes, especially *Polysiphonia*	350 color transparencies of specimens & habitats, glycerine jelly slides of marine algae, serial sections of seagrass anatomy.	
Canadian Wildlife Service CWS	1949	vascular plants especially from wetland habitats	NB, NS, PEI, Magdelan Is., PQ	1,106	0	0	NO	No	NO

Collection	Year Est.	Major Taxa	Geographical Coverage	No. Specimens /lots**	Est. Yearly Growth	Previously Cited Collections	Type Material	Ancillary Material	Remarks
Botany cont'd									
Chatham Museum Collection CMC	1897	vascular plants	Miramichi area	210	0	?	NO	NO	specimens of Cox, Hay, etc. 1897-1902
C. Lobban Collection CLC*	1970	seaweeds	BC, PEI, NS, Quoddy Region, NB	1,000	1%	NO	NO	NO	
Fundy National Park FNP	c.1950	vascular Plants	Fundy National Park	1,000	0	0	NO	NO	
Maritime Forest Research Centre FPF	1950	fungi	Maritime Canada	8,000	1%	NO	NO	color transparencies of species habitats; photomicrographs, host indices, distribution maps.	
H. Harries Collection HHC*	1977	lichens, bryophytes (epiphytes & forest floor sp. only)	NB, NS, (Border Region), Miramichi, Maine, New Hampshire	3,500	14%	NO	NO	NO	research collection
Mount Allison University MAU	1962	vascular plants	South E. NB, E. Canada, New England	4,000	2%	NO	NO	NO	
New Brunswick Museum NBM	c.1875	vascular plants	NB	22,000	1%	G.U. Hay	NO	NO	
University of New Brunswick UNB	1936	vascular plants	Maritime Canada	40,000	15%	Maritime Forest Research Station (Acadia Res. Stat.)	NO	NO	

Collection	Year Est.	Major Taxa	Geographical Coverage	No. Specimens /lots**	Est. Yearly Growth	Previously Cited Collections	Type Material	Ancillary Material	Remarks
Invertebrates (exclusive of insects)									
Atlantic Reference Centre ARC	1973	marine invertebrates	Bay of Fundy, Scotian Shelf, Maritime Canada	8,224**	1%	NO	syntypes	50-75 35mm slides of species	
New Brunswick Museum NBM	c.1900	freshwater unionid molluscs, marine invertebrates	USA, Ont, Bay of Fundy, NS	1,500**	1%	NO	earthworms	NO	material excessible but being re-organized. Mostly early 19th c. collections.
University of New Brunswick Saint John UBJ	1970	marine invertebrates	NB, PEI, NS Bermuda	1,000**	20%	NO			
Entomology									
Agriculture Canada Fredericton ACF	1928	Aphididae only	Maritime Canada	25,000	0	NO	YES 0 unknown	NO	
A.W. Thomas Collection AWT*	1964	80% Tabanidae + Lepidoptera Coleoptera, hymenoptera	NB, S.Carolina	19,000	1%	NO	NO	NO	
N. Rae & Sandra L. Brown Collection BBC*	1970	Lepidoptera	NB, Mexico, C. America	1,000	0	0	NO	NO	

Collection	Year Est.	Major Taxa	Geographical Coverage	No. Specimens /lots**	Est. Yearly Growth	Previously Cited Collections	Type Material	Ancillary Material	Remarks
Entomology cont'd									
C. Majka Collection CMC*	1968	Lepidoptera	NB	2,000	1%	NO	NO	NO	
Agriculture Canada Fredericton FRC	1962	Lepidoptera, Coleoptera, Hymenoptera	Atlantic Canada	10,000	sporadic	McDunnough Lepidoptera	YES	aphid host herbarium	
Jim Edsall Collection JEC*	1968	Lepidoptera only	NS, Ont, NB USA, C. America	8,000	<1%	NO	NO		
New Brunswick Museum NBM		Lepidoptera, Coleoptera, Diptera Hymenoptera, etc.	S. NB	13,000	1%	W.A. McIntosh	NO	NO	
N. Rae Brown Collection NRB*	1938	Siphonaptera, Mallophaga, Anoplura	NB, Ont.	2,000	0	0	NO	NO	willed to NMC.
R.H. Peterson Collection RHP*	1966	Lepidoptera only	Ont., Illinois S. NB, S. USA	3,000	2%	NO	NO	NO	
University of New Brunswick UNB	late 1930's	Lepidoptera, Coleoptera, Diptera,etc.	NB, NS, Ont, PQ Africa, S. America	15-20,000	1%	0	NO	NO	teaching collection.

Collection	Year Est.	Major Taxa	Geographical Coverage	No. Specimens /lots**	Est. Yearly Growth	Previously Cited Collections	Type Material	Ancillary Material	Remarks
Fishes									
Atlantic Reference Centre ARC	1973	marine fishes (90% ichthyoplankton)	Bay of Fundy, Scotian Shelf, Gulf of St. Lawrence, Brown's Bank area	106,000**	3%	ND	ND	35mm slides of specimens & habitats, x-ray photographs.	
New Brunswick Museum NBM	1965	75% freshwater fishes especially cyprinids, 25% marine	NB, Bay of Fundy S. USA	1,089**	1%	ND	ND	field notes.	
Amphibians and Reptiles									
New Brunswick Museum NBM	1965	Rana, Bufo, Hyla, Colubridae	NB, Panama, Fiji, E. Europe	1,047**	3%	ND	ND	35mm slides of specimens & habitats, field notes.	
Birds									
Alan Moses Collection AMC	1901	misc.	Grand Manan, Archipelago, Maine, Mass., Virigina	350	0	ND	ND		first & unusual records for Maritimes. Little added since 1951.
Maritime Forest[1] Ranger School FRS	1968	misc.	NB	200	0	W.H. Moore	ND	ND	teaching collection.
Mount Allison University MAU	1979	misc.	NB, NS, Cape Breton	350	15%	ND	ND	ND	teaching collection but Lapwing & Meadowlark from Cape Breton

1.W.H. Moore material in this collection with data transferred to NBM Jan. 1986.

Collection	Year Est.	Major Taxa	Geographical Coverage	No. Specimens /lots**	Est. Yearly Growth	Previously Cited Collections	Type Material	Ancillary Material	Remarks
New Brunswick Museum NBM	1965	misc.	NB, Ont., USA, Europe	5,704	10%	J.W. Banks, A.G. Boardman, N.R. Brown, A.G. Leavitt, J.S. Lord, A. Moses, etc.	NO	1000+ sets of eggs; nests, skeletons, fluid material, observation files, rare bird scheme, NB bird count data, photos, field notes.	
University of New Brunswick UNB	1978	misc. + Dendrogapus + Scolopax	NB, Miramichi	800	sporadic	NO	NO	includes 320 egg clutches	teaching collection with late 19th c. material of L. Todd (skins) & E.T. Adney (eggs).
Mammals									
New Brunswick Museum NBM	1965	Chiroptera, Insectivora, Rodentia, etc.	NB, Ont., NS, USA	4,446	18%	N.R. Brown	NO	35 mm slides of habitats, observation files, track casts, skeletons of domestic species.	

Status and Future of Natural History Collections in New Brunswick

Numerous authors have emphsized the value and varied uses which may be made of natural history specimens. Readers should consult Miller (1985) for a recent and comprehensive review.

In a general sense, natural history collections in New Brunswick represent an effort to document and interpret the geological, floral, and faunal patterns of the region. While it is doubtless that natural history specimens have been collected for study and exhibit since the earliest explorations of the region, it is interesting that 61% of the collections surveyed have been established since 1950. In spite of this few of the collections have designated curatorial positions. Many collections exist as adjuncts to teaching or research programmes, but nevertheless contain scientific materials worthy of long-term curation. In nearly 75% of the collections specimens have been added only sporadically or at a rate of 1% or less over the past two years. In two cases the collections are even decreasing in size. Although 26% of the specimens in New Brunswick are geological or palaeontological, there was no one concerned with curating geological materials in the province until 1986 when a curator of geology was appointed at the New Brunswick Museum.

Martin (1983) identified problems similar to those noted above among the collections of natural history specimens housed on Prince Edward Island. There the problem is particularly acute as no agency or institution has a mandate to maintain collections. She found there was little money for maintaining natural history collections, most collections were static in size (or deteriorating), and documentation on materials was poor or non-existent. Her study emphasizes how critical the importance of a regional institution with a mandate to maintain collections (i.e.

a museum) is if the long-term survival of specimens is to be assured.

There is of course uncertainty surrounding the future of any collection lacking curatorial staff. Attesting to this are the quantities of older specimens, some from the last century, that have been absorbed into more recently organized New Brunswick collections. Many of these older collections were once held privately. While others were housed in institutions, these institutions, for various reasons, were unable to assume the long-term maintenance of scientific collections. The value of thse older collections should not however be underestimated. Such collections have formed the basis for establishing benchmarks in toxic chemical research and their value will only increase with time (Rick 1975).

The recommendation of Banks *et al.* (1975), with regard to bird collections in the United States and in Canada, can be applied to natural history collections in New Brunswick generally. Collections no longer used, needed, cared for, or wanted by an institution should be transferred to another institution that is prepared to make a commitment to long-term curation of the collection. Equally important, holders of private collections should make adequate provision for the eventual transfer of such collections to an institution where proper care can be assured.

The New Brunswick Museum has a mandate to develop and maintain natural history collections. The institution obviously has a vested interest in ensuring the survival of significant collections. Since this survey was initiated a number of small, but important, collections have been transfered to the NBM and discussions regarding the transfer of other collections are in progress. Although the collections housed at the NBM are probably better organized and more accessible for research now than they have ever been, the collection continues to be underfunded and inadequatelly staffed. The Biological Council of Canada (1977) has noted the neglected state of many of the regional collections across Canada.

While the more than 400,000 specimens that exist in New Brunswick collections may seem like a large number, this figure must be considered in the context of the number of species that occur in the region, and the often large series of specimens (100's) that modern systematic techniques demand. I will use figures for birds and mammals, which are easily available, to illustrate this point. There have been 363 species of birds recorded in New Brunswick. With 5704 bird specimens in provincial collections we have 15.7 specimens/species. This number is somewhat inflated as there is a quantity of foreign material in provincial collections. Figures for mammals are 61.8 specimens/species. Total species of recent marine, freshwater, and terrestrial invertebrates in the province are not readily available (but see Danks1978 and Linkletter *et al.* 1977). Conservative estimates and the 111,224 invertebrate specimens in provincial collections, provide figures that range from 2-5 specimens/species.

While none of the collections in New Brunswick can be considered large, with the exception of the Atlantic Reference Centre icthyoplankton collection, this survey suggests certain taxa are markedly underrepresented by provincial collections. Most notably, non-vascular plants, freshwater invertebrates, and terrestrial invertebrates exclusive of insects. Clayden *et al.* (1984) noted a lack of information for these groups in their survey of rare and vunerable species in the province. This reinforces Danks (1983) contention that regional collections can serve to stimulate scientific research in a region. Like any collection of natural history specimens, those collections in New Brunswick have the potential to provide broad insights in the earth and life sciences. As well, increasing habitat alteration in New Brunswick demands that collections covering the most poorly known groups noted above be developed now if we are to document as fully as possible the flora and fauna of the province.

With this in mind agencies and researchers should be encouraged to deposit field collections with the appropriate institution so that maximum use may be made of such materials.

Obviously New Brunswick is not over-endowed with collections of natural history specimens. Information as basic as the number of species in the province and their distribution is unknown for many groups. Natural history collections will have to be better funded and more adequately staffed if the full potential of provincial scientific collections is to be realized in the future.

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Appendix 1: Questionnaire used in 1984-1985 Survey of natural history collections in New Brunswick.

QUESTIONNAIRE: NEW BRUNSWICK NATURAL HISTORY COLLECTIONS

Information requested will be used in preparing a survey of Natural History Collections. If you neither collect nor house natural history collections please note this in Question 1 and return the questionnaire in S.S.A.E. enclosed. If you do not maintain collections but do collect natural history materials in the course of your activities, answer Question 1 and then go directly to Question 25. Please complete the questionnaire and return to Donald F. McAlpine, Dept. of Natural Sciences, The New Brunswick Museum, 277 Douglas Avenue, Saint John, N.B. E2K 1E5. Each person who submits a questionnaire will be sent a condensation of the compiled data.

---

1. I/We do not collect or house natural history materials _____

   I/We do collect and/or house natural history materials _____

2. Collection housed at: _____

   _____

   Address: _____

   _____

3. Collection is private _____ public _____ institutional use only _____

4. Year collection established _____

5. Rank the purposes (1. primary, 2. secondary, etc.) of your collection.

   Research _____ Reference _____ Education _____ Display _____

6. Do you maintain separate research and education/display collections ? Yes _____ No _____

7. How many specimens/lots in the following categories does your collection include ?

   Geology: _____ Paleontology (list major taxa) : _____

   _____

   Fungi: _____ Non-vascular plants: _____

   Vascular plants: _____ Invertebrates (list major taxa): _____

   _____

   _____

Fishes: _____ Amphibians/Reptiles: _____

_____

Birds: _____ Mammals _____

8. Over the past two years what has been your average annual growth rate in specimens/lots per year in each of the above categories _____

_____

_____

9. How many holotypes are in the collection ?

Number of species: _____ Subspecies: _____

Taxa involved _____

_____

10. Are collections catalogues maintained and/or specimens/lots given a unique number ?

Yes: _____ No: _____

11. Will specimens be loaned for study ? This presumes that loans are usually made to institutions rather than individuals; the loan of holotypes is not expected.

Yes: _____ No: _____

12. Approximately how many such loans have been made in the past two years ? _____

_____

13. How many specimens/lots in total were involved in these loans ? _____

_____

14. Is the collection in sufficent order to permit use by visiting investigators ? _____

_____

15. What portion, if any, of the collection is in storage ? _____

_____

16. Please estimate the number of visitors to the collection in the past two years:

Professional scientists _____

Graduate students _____

Commercially orientated users _____

Undergraduate students _____

Lay persons _____

Tours _____

Others (please specify) _____

17. In your estimation how is your collection used ?

Professional research _____ %

Student reference _____ %

Reference _____ %

Teaching/Education _____ %

Public Service _____ %

Exhibition _____ %

Other uses (please specify) _____ %

18. What geographical areas are best represented in your collection _____

_____

19. Does your collection serve as a depository for voucher specimens at the termination of research projects ?

Yes: _____ No: _____

20. Does the collection include specimens cited in the literature as being in a different collection (ie. formerly private collection now deposited in an institution) ?

Yes: _____ No: _____

What previously cited collections have been combined with yours ? _____

_____

21. What special files are maintained with the collection ? If possible please give approximate numbers.

Photographs/colour transparencies of specimens: _____

Photographs/colour transparencies of habitats: _____

Photomicrographs: _____

Tape recordings: _____

Motion pictures: _____

X-Ray photographs: _____

Others (please specify): _____

22. Are curatorial practices and documentation procedures standardized for the collection ?

Yes: _____ No: _____

Are these available in written form ? Yes: _____ No: _____

23. Have you computerized your collection to assist with collections management and information retrieval ?

Yes: _____ No: _____

24. Curator in charge of collection: _____

_____

Phone: _____

25. If your institution/agency makes scientific collections during the course of research projects and does not maintain permanent collections, is the material routinely deposited in a suitable collection elsewhere ?

Yes: _____ No: _____ Sometimes: _____ Estimate % _____

26. Collection(s) deposited at: _____

_____

27. What are the major taxa involved in your collections ? _____

_____

28. Please estimate specimens/lots made per year by taxa noted in Question 7: _____

_____

_____

29. If you do not deposit material collected in a suitable collection please state reason(s): ___

_____

_____

30. If you do deposit material in a collection, is this collection located in New Brunswick ?

Yes: _____ No: _____

31. If it is not, would you prefer to deposit material in a provincially located institution, assuming suitable facilities were available ?

Yes: _____ No: _____

32. This questionnaire was completed by:

Name: _____

Title: _____

Address: _____

Phone: _____

_____

COMMENTS:

_____

_____

_____

_____

_____

Appendix 2. List of addresses of natural history collections in New Brunswick. Individual responsible for collection is noted in parenthesis. Adresses follow same order as Table 1. Asterisk (*) indicates a private collection.

GEOLOGY

ACF -Soil Survey Unit
Agriculture Canada
P.O. Box 20280
Fredericton, N.B.
E3B 4Z7
(Mr. Herbert W. Rees)

MAU -Department of Geology
Mount Allison University
Sackville, N.B.
E0A 3C0
(Dr. Laing Ferguson)

NBM -Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Dr. Randall F. Miller)

UNB -Geology Department
University of New Brunswick
Box 4400
Fredericton, N.B.
E3B 5A3
(Dr. J.P.A. Noble)

PALAEONTOLOGY

*LFC-Department of Geology
Mount Allison University
Sackville, N.B.
E0A 3C0
(Dr. Laing Ferguson)

MAU -Department of Geology
Mount Allison University
Sackville, N.B.
E0A 3C0
(Dr. Laing Ferguson)

NBM -Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Dr. Randall F. Miller)

PALAEONTOLOGY (con'd)

RFC -Department of Biology
University of New Brunswick
Fredericton, N.B.
E3B 6E1
(Dr. B.A. Screenivasa)

UNB -Geology Department
University of New Brunswick
Box 4400
Fredericton, N.B.
E3B 5A3
(Dr. J.P.A. Noble)

BOTANY

*ART- Department of Biology
University of New Brunswick
Fredericton, N.B.
E3B 6E1
(Dr. A.R.A. Taylor)

*CLC -Biology Department
University of New Brunswick
P.O. Box 5050
Saint John, N.B.
E2L 4L5
(Dr. C. Lobban)

CMC -Chatham Natural History Museum
149 Wellington Street
Chatham, N.B.
E1N 3A2
(Mr. Guy LeBlanc)

CWS -Canadian Wildlife Service
P.O. Box 1590
Sackville, N.B.
E0A 3C0
(Mr. Peter Barkhouse)

FNP -Fundy National Park
P.O. Box 40
Alma, N.B.
E0A 1B0
(Mr. Stephen J. Woodley)

BOTANY (cont'd.)

FPF -Maritimes Forest Research Centre
Forest Insect and Disease Survey
P.O. Box 4000
Fredericton, N.B.
E3B 5P7
(Dr. L.P. Magasi)

*HHC-Department of Biology
Mount Allison University
Sackville, N.B.
E0A 3C0
(Dr. H. Harries)

MAU -Department of Biology
Mount Allison University
Sackville, N.B.
E0A 3C0
(Dr. H. Harries)

NBM -Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Mr. Stephen Clayden) [1]

UNB -Connell Memorial Herbarium
Biology Department
University of New Brunswick
Fredericton, N.B.
E3B 6E1
(Mr. Harold Hinds)

INVERTEBRATES (exclusive of insects)

ARC -Atlantic Reference Centre
Huntsman Marine Laboratory
St. Andrews, N.B.
E0G 2X0
(Dr. Ken Sulak)

NBM -Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Mr. Donald F. McAlpine)

[1] after December, 1986

INVERTEBRATES (cont'd.)

UNJ -Biology Department
University of New Brunswick
P.O. Box 5050
Saint John, N.B.
E2L 4L5
(Dr. M.L.H. Thomas)

ENTOMOLOGY

ARC -Agriculture Canada
Research Station
Fredericton, N.B.
E3B 4Z7
(Dr. Gilles Boiteau)

*AWT -Maritimes Forest Research Centre
P.O. Box 4000
Fredericton, N.B.
E3B 5P7
(Dr. A.W. Thomas)

*BBC - 100 Burpee Street
Fredericton, N.B.
E3A 1L9
(Professor N. Rae Brown)

*CMC -R.R. #2
Albert, N.B.
E0A 1A0
(Mr. Chris Majka)

FRC -Maritimes Forest Research Centre
Forest Insect and Disease Survey
Insect Reference Collection
P.O. Box 4000
Fredericton, N.B.
E3B 5P7
(Dr. L.P. Magasi)

*JEC-R.R. # 6
Saint John, N.B.
E2L 3W6
(Mr. Jim Edsall)

ENTOMOLOGY (cont'd)

NBM - Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Mr. Donald F. McAlpine)

*NRB - 100 Burpee Street
Fredericton, N.B.
E3A 1L9
(Professor N. Rae Brown)

*RHP - 75 Ernest Street
St. Andrews, N.B.
E0A 2X0
(Mr. Richard Harry Peterson)

UNB - Department of Forest Resources
Faculty of Forestry
Bag No. 44555
University of New Brunswick
Fredericton, N.B.
E3B 6C2
(Chairman, Dept. of Forest Resources)

FISHES

ARC - Atlantic Reference Centre
Huntsman Marine Laboratory
St. Andrews, N.B.
E0G 2X0
(Dr. Ken Sulak)

NBM - Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Mr. Donald F. McAlpine)

AMPHIBIANS and REPTILES

NBM - Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Mr. Donald F. McAlpine)

BIRDS

AMC - Alan L. Moses Memorial Bird Collection
Grand Manan Museum
Grand Harbour, Grand Manan, N.B.
E0G 1X0
(Mr. Otis Green)

MFS - Maritime Forest Ranger School
R.R. #5
Fredericton, N.B.
E3B 4X6
(Mr. R.F. Stocek)

MAU - Biology Department
Mount Allison University
Sackville, N.B.
E0A 3C0
(Ms. Gay Hanson)

NBM - Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Mr. Donald F. McAlpine)

UNB - Department of Forest Resources
Faculty of Forestry
Bag No. 44555
University of New Brunswick
Fredericton, N.B.
E3B 6C2
(Dr. Dan Keppie)

MAMMALS

NBM - Department of Natural Sciences
New Brunswick Museum
277 Douglas Avenue
Saint John, N.B.
E2K 1E5
(Mr. Donald F. McAlpine)

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